

AMERICAN SPECIES OF THE GENUS *BRACHYUNGUIS* DAS (HOMOPTERA:
APHIDIDAE), INCLUDING TWO NEW SPECIES

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Abstract.—Two New World species belonging to the nearly cosmopolitan genus *Brachyunguis* Das are described. *Brachyunguis bahamondesi* from Argentina is known by its apterous and alate viviparous females living on *Atriplex lampa* and *Chenopodium soolanum*. *Brachyunguis bishopi* from U.S.A. (Idaho and Oregon) lives on *Sarcobatus vermiculatus*. Morphs representing the complete life cycle of the latter species, from the fundatrix to the sexual morphs, have been observed. Both new aphids are compared with *B. bonnevillensis* (Knowlton) and a key is given for the five species of the genus represented on the American continents.

Resumé.—Deux nouvelles espèces américaines du genre *Brachyunguis* Das sont décrites. *Brachyunguis bahamondesi* n. sp. existe en Argentine sur *Atriplex lampa* et *Chenopodium soolanum* et est connu par ses formes vivipares aptères et ailées. *Brachyunguis bishopi*, trouvé aux USA (Idaho et Oregon), vit sur *Sarcobatus vermiculatus* et son cycle complet a été observé, depuis la fondatrice jusqu'aux formes sexuées. Les deux espèces sont comparées à *B. bonnevillensis* (Knowlton) et une clé permet de séparer les 5 espèces du genre représentées sur le continent américain.

Key Words: *Brachyunguis*, *Xerophilaphis*, new species, key, Chenopodiaceae, U.S.A., Argentina

Species of the genus *Brachyunguis* Das, 1918 (type species: *B. harmalae* Das, 1918) and its subgenus *Xerophilaphis* Nevsky, 1928 (type species: *X. saxaulica*) are widespread in arid regions of the world, their species colonizing xerophytic plants, notably Chenopodiaceae, Tamaricaceae and Zygophyllaceae.

Three species are known in the New World:

B. (X.) tetrapteris (Cockerell, 1902),

living on *Atriplex* and *Suaeda* in northwestern Mexico and southwestern USA, possibly as far north as central Utah, but probably not in southern Idaho.

B. bonnevillensis (Knowlton, 1928), living on *Atriplex*, *Sarcobatus*, and a few other Chenopodiaceae in the western half of the USA and in the state of Durango, Mexico.

B. (X.) blanchardi Remaudière and Bahamondes, 1987 has been found only on *Allenrolfea* in Argentina (province Mendoza).

Two new species are described here: *Brachyunguis bishopi* n. sp., was found on *Sarcobatus* in Idaho and Oregon by the second author; *Brachyunguis bahamondesi* n. sp., was found on *Atriplex* by L. Bahamondes and on *Chenopodium* by D. Matile Ferrero in Argentina (Mendoza Province).

In the text and tables, the following abbreviations are used:

- ant.I, III, IV, V, VI: antennae segments I, III, IV, V, VI;
 VIb.: base of antennal segment VI;
 p.t.: processus terminalis;
 u.r.s.: ultimate rostral segment;
 h.t.II: second segment of hind tarsus;
 abd.: abdomen;
 abd.terg.VIII: abdominal tergite VIII;
 siph.: siphunculus;
 BL: body length;
 b.d.III: basal diameter of ant.III.

***Brachyunguis bahamondesi* Remaudière
 and Halbert, NEW SPECIES**

Apterous viviparous female (n = 80).— Insect pale, with only siphunculi, apical $\frac{1}{8}$ to $\frac{1}{6}$ of tibiae and tarsi black; head, ant.VI, rostral segments III and IV, anal, subgenital and spiracular plates dark; thorax and abd. without pigmentation, including abd.terg.VII and VIII, intersegmental sclerites rarely distinct, often absent; cauda with darkened base and lighter apex.

Frontal profile convex, slightly sinuated; setae on vertex shorter than b.d.III (11–16 μ m); clypeus rather broad, expanded to occupy $\frac{3}{4}$ to $\frac{1}{2}$ of the interantennal space but never exceeding the frontal profile; antennae 6 segmented, 0.43 to 0.65 times BL; ant.III 7 to 10 times longer than its median diameter, antennal setae short (8–11 μ m, i.e. 0.5 to 0.7 times b.d.III); p.t. = 1.11 to 1.40 VIb.; antennal segment lengths: ant.III = 0.17 to 0.26 mm, ant.IV = 0.12 to 0.18 mm, ant.V = 0.12 to 0.16 mm, ant.VIb = 0.077 to 0.099, pt = 0.077 to 0.123; BL 2.6–3.5 times length of rostrum, rostrum reaching the third coxae, measuring 0.40 to 0.45 mm; u.r.s. pointed, with straight sides

or slightly concave, without significant constriction at the level of the subapical setae, 2.2 to 2.9 times as long as its basal width and 5.4 to 6.0 times its subapical width, 1.08 to 1.24 longer than h.t.II, with 2 accessory setae. Posterior seta on trochanter shorter (0.4 to 0.7 times) than the basal diameter of femur, 1.0 to 1.7 times b.d.III; first tarsal segments with 3,2(3),2 setae; h.t.II = 0.088 to 0.107 mm. Siphunculi cylindrical, 2.7 to 3.7 times as long as their median diameter, nearly always a little shorter than the cauda (0.73 to 1.04 times); cauda longer than its basal width, triangular, without constriction, with 6–8 setae; abd.terg.VIII with 2 setae 25–38 μ m long (1.5 to 2.0 times b.d.III); subgenital plate with 2 anterior and 7–11 posterior setae. Marginal tubercles only on pronotum and abd.terg.I and VII. Dorsal abdominal cuticle often slightly reticulated.

Alate viviparous female (n = 38).— Head, thorax, apex of tibiae, tarsi and siphunculi almost black; ant.I, apex of ant.V, ant.VI, coxae, small marginal sclerites on abd.terg.I–IV, cauda, anal, subgenital and spiracular plates more or less darkened, like apical half of femur III.

Ant.III with 3–9 widely flanged secondary rhinaria (3–4: 9% of specimens, 5–7: 77% of specimens and 8–9: 15% of specimens; n = 69); IV with 0–2 rhinaria (0: 65% of specimens, 1: 29% of specimens and 2: 6% of specimens); antennal segment lengths: ant.III = 0.23 to 0.28 mm, ant.IV = 0.15 to 0.19 mm, ant.V = 0.15 to 0.18 mm, ant.VIb = 0.085 to 0.110 mm, p.t. = 0.107 to 0.140 mm. First segment of tarsus with 3,2(3),2 setae.

Type material.—Holotype: apterous viviparous female collected on *Atriplex lampa* Gillies ex Moquin at Guyamallen (Mendoza province, Argentina), 14-XI-1989, (L. Bahamondes, in coll. MNHN 013274). Paratypes: apterous and alate viviparous females found with the holotype; apterae and alatae collected on *Chenopodium soanum* Aellen at Cachauta, 1300 m (Mendoza, Argentina), 5-XII-1993 (D.

Table 1. Comparison between *Brachyunguis bonnevillensis*, *B. bishopi*, and *B. bahamondesi*. Extreme values are in parentheses.

	<i>bonnevillensis</i>	<i>bishopi</i>	<i>bahamondesi</i>
Apterous Viviparous Females			
n	36	33	20
Measurements (in mm)			
BL	(0.96) 1.20–1.80 (2.17)	(1.20) 1.60–2.00 (2.25)	(1.08) 1.30–1.60 (1.72)
u.r.s.	(.085) .096–.110 (.115)	(.096) .110–.130 (.137)	.110–.121
siph.	(.044) .070–.130 (.164)	(.079) .110–.190 (.219)	(.096) .110–.150 (.159)
cauda	(.104) .130–.180 (.214)	(.110) .130–.170 (.203)	(.112) .120–.145 (.150)
Ratios			
p.t./VIb.	(0.53) 0.60–0.95 (1.01)	0.69–0.90 (1.00)	(1.00) 1.10–1.25 (1.36)
u.r.s./ht.II	(0.81) 0.90–1.00 (1.03)	(0.87) 0.92–1.00 (1.11)	1.10–1.25
siph./cauda	(0.42) 0.50–0.75 (0.87)	(0.70) 1.00–1.20 (1.25)	(0.73) 0.84–0.95 (1.04)
siph./ant.III	(0.33) 0.37–0.55 (0.64)	(0.56) 0.60–0.75 (0.89)	(0.50) 0.55–0.70 (0.79)
Length of setae (in μm)			
ant.III	8–14	22–47	8–11
vertex	11–22	35–60	11–16
femur I	11–25	27–55	14–19
abd. terg. VIII	14–27	41–60	25–41
Alate Viviparous Females			
n	29	16	20
Measurements (in mm)			
BL	(1.23) 1.40–1.85 (2.17)	(1.58) 1.70–1.90 (2.02)	1.21–1.64
u.r.s.	(.096) .101–.112	(.104) .110–.123 (.129)	.107–.115 (.123)
siph.	(.055) .065–.115 (.121)	(.088) .105–.135 (.164)	.107–.126 (.145)
cauda	(.099) .120–.160 (.184)	(.134) .140–.160 (.170)	(.088) .107–.130 (.137)
Ratios			
p.t./VIb.	0.59–0.85 (1.00)	0.71–0.95 (1.00)	1.11–1.30 (1.40)
u.r.s./ht.II	(0.82) 0.85–0.95 (1.00)	(0.84) 0.90–1.05	1.08–1.18 (1.24)
siph./cauda	0.49–0.58	(0.58) 0.70–0.85 (1.05)	0.93–1.13
siph./ant.III	0.29–0.40 (0.44)	(0.35) 0.40–0.53	0.44–0.55
Length of setae (in μm)			
ant.III	8–12	14–36	8–16
vertex	14–25	27–55	14–17
femur I	14–22	27–41	11–19
abd. terg. VIII	19–33	38–55	25–38

Matile Ferrero coll.; MNHN 015084). The holotype is preserved in the MNHN. Paratypes are deposited in the authors' collections, in the USNM, and in the BMNH (London).

Etymology.—The species is named after Dr. L. Bahamondes as an acknowledgment for the important aphid material received from him during the last 25 years.

Discussion.—*Brachyunguis bahamondesi* differs from the 2 other American species of *Brachyunguis* s. str. by its black siphunculi, p.t. distinctly longer than VIb. and its

ratio u.r.s./ht.II exceeding 1.05. Like *B. bonnevillensis*, its setae are short (Table 1). In the recent key to the South American Aphidina (Remaudière 1994), the species mentioned as *B. sp.* is *B. bahamondesi*.

***Brachyunguis bishopi* Remaudière and Halbert, NEW SPECIES**

Fundatrix (n = 4).—Body pale, but with eyes, antennae (except ant.II, basal ½ of ant.III, and sometimes basal ½ of IV, lighter), clypeus, apical segments of rostrum, apices of tibiae, tarsi, cauda, anal plate dark

to black; siphunculi, basal $\frac{3}{4}$ of tibiae, subgenital and spiracular plates hardly darkened; intersegmental sclerites distinct, slightly pigmented.

Insect rotund, only 1.3–1.4 as long as wide (in moderately flattened slides). Head with the frontal line convex; vertex with long setae (47–50 μm , a little longer than b.d.III); antennae 5 segmented, about $\frac{1}{2}$ of BL; ant.III 12–13 times longer than its median diameter, with long and pointed setae (27–41 μm , 1.3–1.9 times b.d.III); p.t. short, only 0.66–0.68 times Vb; antenal segment lengths: ant.III = 0.34 to 0.39 mm, ant.IV = 0.16 to 0.18 mm, ant.Vb = 0.13 to 0.14 mm, p.t. = 0.088 to 0.093 mm. Rostrum not reaching the third coxae, measuring 0.51 to 0.57 mm; u.r.s. subequal to h.t.II (0.90–0.98 times) with 2 accessory setae. Siphunculi short, delicately imbricated, BL 15–21 times length of siphunculi, siphunculi 2.0–2.7 times as long as their median diameter, shorter than the cauda (0.63–0.82 times); cauda triangular, with 8–12 setae; abd.terg.VIII with 4–7 long setae (58–63 μm , about 3 times b.d.III); subgenital plate with 3–5 anterior and 9–17 posterior setae. Branches of the mesothoracic furca joined on a very wide base. Marginal tubercles inconspicuous on the pronotum but evident on the abd.terg.I and VII as well as on most of abd.terg.II to V.

Apterous viviparous female ($n = 70$).—Body quite pale except apex of ant.V, middle of ant.VI and tarsi slightly darkened.

Frontal profile sinuated with the median part clearly higher than the short antennal tubercles; eyes prominent; clypeus conspicuously bulging although rarely exceeding $\frac{2}{3}$ of the interantennal space; setae on vertex long and thin (35–60 μm , 1.7–2.5 times b.d.III); antennae 6 segmented (5 segmented in dwarfish summer specimens), about $\frac{1}{2}$ (0.41–0.55 times) of BL; setae on ant.III 22–47 μm , 1.3 to 2.0 times b.d.III; p.t. = 0.69 to 0.95 (1.00) times VIb.; antennal segment lengths: ant.III = 0.12 to 0.30 mm, ant.IV = 0.08 to 0.23 mm, ant.V = 0.10 to 0.22 mm, ant.VIb = 0.09 to 0.16 mm, p.t.

= 0.038 to 0.118; BL 2.9 to 4.3 times rostrum, rostrum almost reaching the hind coxae, measuring 0.38 to 0.54 mm; u.r.s. usually subequal to h.t.II (0.87–1.10), 2.2–2.6 longer than its basal width and 4.0–4.7 its subapical width. Posterior seta on trochanter usually subequal (0.7–1.2) to the basal diameter of the femur, 1.9–2.9 b.d.III; dorsofemoral setae long (25–55 μm , 1.3–2.4 b.d.III); first joint of tarsus with 3,3(2),2 setae; h.t.II = 0.096 to 0.151 mm. Siphunculi cylindrical, hardly imbricated, with subapical constriction and distinct flange, 2.2 to 4.4 longer than their median diameter, varying from 0.70 to 1.25 as long as the cauda; abd.terg.VIII with 4–8 (frequently 5–6) long setae (35–60 μm , 1.7 to 3 times b.d.III); cauda without constriction and often a little longer than its basal width, with 6–9 setae (rarely up to 13); subgenital plate with 3–6 anterior and 9–14 (17) posterior setae. Marginal tubercles on the pronotum and abd.terg.I and VII as well on some, or most, of abd.terg.II–V.

As frequently occurs in aphids evolving in arid climates, a very high seasonal variability is observed between specimens. Dwarfing occurs in hot and dry periods with marked allometric changes in morphology such as reduction of the number of antennal segments and shortening of siphunculi, cauda, and setae. The number of marginal tubercles does not seem affected by this kind of stress, but variability occurs in the number of lateral abdominal tubercles and is not yet understood.

Alate viviparous female ($n = 19$).—Head and thorax very dark; antennae variably pigmented with ant.I and II dark, ant.III–VI darkened either over their whole length or, at least, on their apical half; legs pale with apex of tibiae and tarsi darkened; femora sometimes dark on apical $\frac{1}{2}$ to $\frac{2}{3}$ and the tibiae slightly pigmented; abdomen with marginal sclerites on segments II–IV; siphunculi, cauda, anal, and subgenital plates occasionally darkened.

Antennae 0.5–0.6 times BL, ant.III with 2–9 secondary rhinaria (mostly 4–7) irreg-

ularly distributed on its whole length; ant.IV rarely (1 of 34 observed antennae) with 1 rhinarium; antennal segment lengths: ant.III = 0.23 to 0.31 mm, ant.IV = 0.16 to 0.21 mm, ant.V = 0.16 to 0.21 mm, ant.VIb = 0.121 to 0.148 mm, p.t. = 0.090 to 0.126. Siphunculi shorter than those of the apterae: ratio of siph./cauda usually 0.70-0.86 but extreme values such as 0.58 and 1.05 are observed. Setae a little shorter than in apterae (table 1) but their length more or less corresponds to that of the summer and fall apterous specimens. Marginal tubercles rarely present on the abd.terg.II to V (a single tubercle was observed on these tergites only in $\frac{1}{3}$ of the studied specimens).

Oviparous female (n = 14).—Aspect and pigmentation like that of the apterous viviparous female. Dark pea green to grey in life. Antennae 6 segmented (sometimes 5 segmented); antennal segment lengths: ant.III = 0.10 to 0.17 mm, ant.IV = 0.08 to 0.11 mm, ant.V = 0.09 to 0.12, ant.VIb = 0.08 to 0.10 mm, p.t. = 0.076 to 0.096 mm. Tibia III slightly incrassate, with 10–30 circular pseudosensoria (diameter: 5–13 μ m). Siphunculi shorter than in the apterous viviparous female (0.05–0.10 mm), 1.3 to 2.2 as long as their median diameter; abd.terg.VIII with 8–12 rather long setae (33–55 μ m); cauda with 9–12 setae; subgenital plate covered with approximately 40 setae. Marginal tubercles rarely present on one of abd.terg.II–V.

Apterous male (n = 6).—Head, antennae, genitalia and anal plate strongly pigmented, as is a narrow band on abd.terg.VIII; legs and siphunculi variably darkened. Very dark grey in life.

Antenna 6-segmented, exceeding $\frac{2}{3}$ (0.68–0.78 times) of BL; ant.III with 3–11 secondary rhinaria, IV with 3–12, V with 4–11 and VIb. with 2–5; antennal segment lengths: ant.III = 0.18 to 0.24 mm, ant.IV = 0.11 to 0.19 mm, ant.V = 0.12 to 0.16 mm, ant.VIb = 0.098 to 0.115 mm, p.t. = 0.082 to 0.096 mm. Siphunculi short (0.04–0.06 mm), not more than 1.5–1.8 times their

median diameter; ratio siph./cauda low: 0.57–0.71; abd.terg.VIII with 4–7 setae. Marginal tubercles irregularly present on a few of abd.terg.I–V: often 0, sometimes 1 to 3.

Type material.—Holotype: apterous viviparous female on *Sarcobatus vermiculatus* (Hook) Torr., Canyon Co., Parma (Idaho, USA), 21-V-1993 (S. Halbert coll., #1452). Paratypes: apterous and alate viviparous females collected with the holotype; fundatrices on the same host, Parma, 21-IV-1991 (S.H. #1554; MNHN 013844); apterous, idem, 23-VIII-1986 (S.H. #660; MNHN 012833); idem, 14-VII-1991 (S.H. #1358; MNHN, 015348); apterous and alate, idem, 5-V-1992 (S.H. #1406; MNHN 015349); idem, 7-VII-1994 (Coll. Peggy Graves and Debra Stansell, S.H. #1517; MNHN 015345); apterous viviparous females, apterous males and oviparous females, idem, 18-X-1994 (S.H. #1550; MNHN 015346); vagrant and trapped alate in Adrian (Oregon), Parma, Burley and Aberdeen (Idaho) from 1986 to 1994. The holotype of *B. bishopi* is preserved at the USNM (Washington, D.C.). Paratypes are deposited in the authors' collections, in the USNM, in the BMNH (London), and in the W.F. Barr Museum at the University of Idaho, Moscow, ID.

Etymology.—The new aphid is named for Guy W. Bishop, Professor Emeritus of the University of Idaho, in honor of his significant contributions to knowledge of Idaho aphids over his 30-year career.

Discussion.—After the first detection of this new species, 8 years elapsed before the discovery of every morph of its life cycle. The aphid is monoecious holocyclic, and its single known host is *Sarcobatus vermiculatus*. The related species *B. bonnevillensis* lives on the same host but also colonizes some other Chenopodiaceae, particularly *Atriplex canescens* (Pursh) Nutt. Both species are represented in the studied area and both colonize terminals of *S. vermiculatus*.

Living specimens differ in color. *Brach-*

yunghuis bishopi is dark pea green, whereas *B. bonnevillensis* is paler and has a frosty appearance due to wax much like the leaves of *A. canescens* which seems to be its preferred host. *Brachyunguis bishopi* was attended by ants on every occasion it was observed, whereas *B. bonnevillensis* colonies often occur without ants. Both species are sedentary and appear to rely on camouflage rather than evasive behavior to protect them from predators. The shape, color, and preferred feeding site of *B. bishopi* makes the aphids look very similar to emerging leaves of *S. vermiculatus*, which are fleshy and cylindrical.

In mounted material, *B. bishopi* shows distinctly longer setae than *B. bonnevillensis* (table 3); its siphunculi, in spite of their variability, appear as relatively longer in the apterous viviparous morph, with the ratio siph./ant.III rarely smaller than 0.66 (rarely higher than 0.55 in *B. bonnevillensis*). Winged forms in trap samples can be separated easily by examining lateral abdominal setae on posterior abdominal segments (see key below, couplet 6).

KEY TO THE AMERICAN SPECIES OF
BRACHYUNGUIS S. L.

The key has been established from the following material corresponding to the 3 former species known in the American continents.

Brachyunguis (Xerophilaphis) tetrapteralis: collected on *Suaeda californica* at La Rumorosa (Baja California del Norte, Mexico), 12-IV-1981 and on *S. suffrutescens* at Guerrero Negro (Baja California del Sur), 15-IV-1981 (G. Remaudière & A. L. Muñoz Viveros, MNHN 06988 and 07000).

B. (X.) blanchardi: type series from Argentina on *Allenrolfea vaginata* (Remaudière & Bahamondes 1987) and additional material including several alatae from *Uspallata* (Mendoza, Argentina), 14-XI-1987 (L. Bahamondes, MNHN 011173).

B. bonnevillensis: paratypes on *Sarcobatus vermiculatus* from Milford (Utah, USA), 6-V-1927 (G.F. Knowlton, remount-

ed slides from USNM); specimens on *Atriplex* sp., north of Gomez Palacio (Durango, Mexico), 15-X-1980 (G. Remaudière; MNHN 06504) and on *Atriplex ?canescens*, Cerros Bismark, La Ascensión (Chihuahua, Mexico), 15-X-1990 (A.L. Muñoz Viveros, MNHN 014438); various samples from Idaho and Oregon, USA (S. Halbert, P. Graves, and D. Stansell).

1. Clypeus enlarged, hemispherical, nearly filling the space between the antennae and obviously expanded in the frontal profile subgenus *Xerophilaphis* 2
- Clypeus less developed, never expanded in the frontal profile *Brachyunguis* s. str. 3
- 2(1). Siphunculi very short (0.04–0.06 mm); p.t. < VIb. (0.5–0.7); USA, Mexico *B. (X.) tetrapteralis*
- Siphunculi longer (0.16–0.21 mm); p.t. = VIb. (0.97–1.11); Argentina *B. (X.) blanchardi*
- 3(1). Siphunculi black; p.t. \geq VIb. (1.00–1.40); u.r.s./h.t.II 1.08–1.25; abd.terg.VIII with 2 (rarely 3) setae; Argentina *B. bahamondesi*, n. sp.
- Siphunculi pale; p.t. usually \leq VIb. (0.53–1.01); u.r.s./h.t.II 0.81–1.11; abd.terg.VIII mostly with 4–5 setae 4
- 4(3). Material mounted on slides 5
- Material in alcohol or living specimens . . . 6
- 5(4). Marginal tubercles present on one or more abd.terg.II–V, very rarely totally missing on these segments in the apterous viviparous morph; setae long (table 1); siph/cauda = 0.70–1.25 in apterous morph; USA *B. bishopi*, n. sp.
- Marginal tubercles absent on abd.terg.II–V; setae short (see table 1); siph/cauda = 0.42–0.82 in apterous morph; USA, Mexico *B. bonnevillensis*
- 6(4). Lateral abdominal setae long; spring specimens with siphunculi more than 2 times as long as their median diameter; in life, color dark pea green *B. bishopi*
- Lateral abdominal setae short, hardly visible on abd.terg.VI–VII; siphunculi always less than 2 times as long as their median diameter; in life, color frosty green *B. bonnevillensis*

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LITERATURE CITED

- Cockerell, T. D. A. 1902. A new plant louse from southern California. Bulletin of the Southern California Academy of Sciences 1: 40.
- Das, B. 1918. The Aphididae of Lahore. Memoirs of the Indian Museum 6: 135-274.
- Knowlton, G. F. 1928. A few western aphids with descriptions of three new species. Annals of the Entomological Society of America 21: 259-268.
- Remaudière, G. 1994. Revue et clé des espèces Sud-Américaines d'Aphidina et description d'un *Aphis* nouveau (Homoptera, Aphididae). Revue française d'Entomologie 16: 109-119.
- Remaudière, G. and L. Bahamondes. 1987. Un *Brachyunguis* (*Xerophilaphis*) nouveau d'Argentine (Homoptera, Aphididae). Revue française d'Entomologie 9: 179-185.